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EXAMINER	
PEREZ, JULIO R	
ART UNIT	**PAPER NUMBER**
2681	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/019,705	KALLIOJARVI, KARI	
	Examiner	Art Unit	
	Julio R Perez	2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-14, 19, 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink et al. (6195556).

Regarding claim 1, Reudink et al. disclose a method of determining a distance between a transmitting station and a receiving station comprising the steps of: measuring at least one feature of a signal received from the transmitting station at the receiving station, said feature being such that it can be used for determination of the distance between the transmitting station and the receiving station (col. 3, lines 50-57; col. 6, lines 9-20; col. 7, lines 9-20, signal strength is provided at the mobile station, corresponding to one of the characteristics of a received signal at the receiver); and computing the distance between the transmitting station and the receiving station using said measured signal feature and the characteristic parameter describing the line-of-sight conditions of the receiving station (col. 7, lines 27-67, the system provides means for determining the extent of space between the transmitting BTS and the mobile unit with the signal strength information, which determines the position of the mobile; thus, providing means to calculate the range between the mobile and the BTS by the

performance of the product of the speed of light and the travel time of the signal from the BTS to the mobile unit).

Reudink et al. do not explicitly disclose determining a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of the receiving station.

However, the preceding limitation is well known in the art of telecommunications.

Reudink et al. strongly suggests the use of road map that includes different signal attributes as related to the various environments encountered by the movement of the mobile device (col. 3, lines 25-50; col. 6, lines 52-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system with conventional propagation prediction and determination tools because it would provide the system with full radio frequency modeling capabilities and terrain-based propagation model analysis so that integration of scanned topographic maps used as a base layer in the system can produce clear and easy to see RF coverage and analysis maps of the propagation environment under study. Further, the physical cell boundaries are not symmetrical for up and down link due to local and receiver noise; hence, in order to avoid areas without coverage, the latter has to be taken into account using commercial Hata-Okumura model-based radio planning software to simulate the propagation of the signal and determine the various conditions of the propagation signals on different propagation environments. Therefore, providing an extra parameter in addition to the signal strength

provided by the mobile unit so that a more efficient and accurate position may be determined.

Regarding claim 2, Reudink et al. disclose a method, further comprising a step of determining the current geographical location of the transmitting station (col. 6, lines 59-67; col. 7, lines 1-8, a GPS is incorporated into a BTS to provide its position).

Regarding claims 3-4, Reudink et al. disclose a method, further comprising: at least one further step of determining similar to said step of determining of claim 1 for determining at least one further distance between the transmitting station and at least one further receiving station having a characteristic parameter describing the radio propagation environment of the at least one further receiving station (col. 3, lines 25-50; col. 6, lines 52-67; col. 7, lines 1-2; col. 9, lines 47-67; col. 10, lines 1-9, several parameters are combined to acquire the exact position of the mobile unit or range between the mobile unit and base station; study of the signal propagation environment is accomplished by utilization of known prediction propagation tools and thorough system tests are operated to record attributes related to propagation environment around the mobile) ; and combining the results of the determinations for receiving the current geographical location of the transmitting station (col. 7, lines 48-67; col. 8, lines 1-24; col. 9, lines 65-67; col. 10, lines 1-9, the collection of the various parameters related to the mobile unit movement results in the accurate position of the mobile unit relative to the base station position).

Regarding claim 5, Reudink et al. disclose a method, wherein said at least one feature comprises at least travel time of the signal between the transmitting and

receiving stations (col. 7, lines 22-27; col. 8, lines 1-9, the time for the signal to propagate from BTS to the mobile unit is determined by the speed of light and the range between them).

Regarding claim 6, Reudink et al. disclose a method, wherein said at least one feature comprises at least signal travel time differences between the transmitting and receiving stations (col. 7, lines 22-27; col. 8, lines 1-29, the characteristics of the position calculation include TDA, time difference of arrival).

Regarding claim 7, Reudink et al. disclose a method, wherein said at least one feature comprises at least strength of the received signal (col. 7, lines 9-20 and 28-42, signal strength is conventionally measured by the BST as well by the mobile unit).

Regarding claim 8, Reudink et al. disclose a method, wherein said at least one feature comprises quality of the received signal (col. 7, lines 58-67, the signal strength is provided through the mobile and the BTS).

Regarding claim 9, Reudink et al. do not explicitly disclose steps of using a weighted least square method for calculating a location of the transmitting station, wherein a used weighting matrix is an inverse of an error covariance matrix.

However, the preceding limitation is well known in the art of telecommunications.

Reudink et al. teaches a variety of ways to determine the accurate location of the mobile unit with respect to the BTS. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system as taught by Reudink et al. with the method used in the conventional LSM program, which is known to require a function and point coordinates with their measuring uncertainties, and it

assumes that all point uncertainties are known and may be different, in order to find curve parameters with their uncertainties, and hence, provide extra features to make more accurate calculation of the mobile position.

Regarding claim 10, Reudink et al. do not explicitly disclose a method, further comprising steps of: defining radio propagation environments for several stations; and classifying the stations in different radio propagation environment classes; wherein the characteristic parameter is based on the class of the station.

However, the preceding limitation is well known in the art of telecommunications.

Reudink et al. strongly teaches the use of road map that includes different signal attributes as related to the various environments encountered by the movement of the mobile device (col. 3, lines 25-50; col. 6, lines 52-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system with propagation prediction and determination tools because it would provide the system with full radio frequency modeling capabilities and terrain-based propagation model analysis so that integration of scanned topographic maps used as a base layer in the system can produce clear and easy to see RF coverage and analysis maps of the propagation environment under study. When using a propagation model radio frequency planner, operators are known to classify the different types of propagation environments into urban, suburban, and rural areas, in order to get a feeling of the different conditions that surround the particular environments such as natural obstacles, for instance trees, and man-made structures such as buildings. The former may be performed with Hata-Okumura model

based radio-planning software to simulate the signal propagation in order to optimize the location of the different base stations. That together with a site survey is always needed to actually measure the noise of other radio sources.

Regarding claim 11, Reudink et al. disclose a method, wherein data for the characteristic parameter is stored and processed in a location service node implemented in a telecommunications system (col. 11, lines 51-61, the attributes collected may be transferred to a database controller within the system for further processing).

Regarding claim 12, Reudink et al. disclose a method, wherein the stations are connected to a mobile telecommunications system, the transmitting station being a mobile station and the receiving station being a base station of the mobile telecommunications system or vice versa (col. 5, lines 58-67; col. 6, lines 1-2; Fig. 1, the present system is with respect to cellular telephony).

Regarding claim 13, Reudink et al. disclose a method, wherein the transmitting station and the receiving station are implemented in a telecommunications system, and wherein the step of determining the characteristic parameter comprises the steps of: determining a current geographical location of at least one of the stations by means which are external to the telecommunications system (col. 6, lines 59-67; col. 7, lines 1-8, the location position of the BTSs or mobile units may be provided by a Satellite location system); and inputting the results of the determination to the telecommunications system (col. 7, lines 2-20, the attributes collected including the GPS information data is provided to the communication system).

Regarding claim 14, Reudink et al. disclose a method, comprising use of a satellite based positioning system for the step of determining the current geographical location of at least one of the stations (col. 6, lines 64-67; col. 7, lines 6-8, a satellite based positional system may be utilized).

3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink et al. (6195556).

Regarding claim 19, Reudink et al. do not explicitly disclose an arrangement, wherein different radio propagation environments of different stations are classified in different radio propagation environment classes and the characteristic parameter is based on the class of the station.

However, the preceding limitation is well known in the art of telecommunications.

Reudink et al. strongly suggests the use of road map that includes different signal attributes as related to the various environments encountered by the movement of the mobile device (col. 3, lines 25-50; col. 6, lines 52-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system with conventional propagation prediction and determination tools because it would provide the system with full radio frequency modeling capabilities and terrain-based propagation model analysis so that integration of scanned topographic maps used as a base layer in the system can produce clear and easy to see RF coverage and analysis maps of the propagation environment under study. When using a conventional propagation model radio frequency planner, operators conventionally classify the different types of propagation

environments into urban, suburban, and rural areas, in order to get a feeling of the different conditions that surround the particular environments such as natural obstacles, for instance trees, and man-made structures such as buildings. The former may be performed with Hata-Okumura model based radio-planning software, such model is conventional, to simulate the signal propagation in order to optimize the location of the different base stations. That together with a site survey is always needed to actually measure the noise of other radio sources.

Regarding claim 24, Reudink et al. disclose an arrangement in a telecommunications system for creating and/or updating data concerning a radio propagation environment of a station of the telecommunications system, comprising: a first station (col. 5, lines 58-67; col. 6, lines 1-2; Fig. 1, the present system is with respect to cellular telephony, which include mobile stations); a second station for communicating by radio with the first station ((col. 5, lines 58-67; col. 6, lines 1-2; Fig. 1, the present system is with respect to cellular telephony,; further including base stations to communicate with a mobile station); means for defining a current geographical location of the first station be means of a source of location information that is external to the telecommunications system(col. 6, lines 59-67; col. 7, lines 1-8, the location position of the BTSs or mobile units may be provided by a satellite location system) ; determining means for determining a feature of a radio signal received by one of the stations from the other of the stations (col. 3, lines 50-57; col. 6, lines 9-20; col. 7, lines 9-20, signal strength is provided at the mobile station, corresponding to one of the characteristics of a received signal at the receiver).

Reudink et al. do not explicitly disclose calculating means for calculating a parameter of the radio propagation environment by means of the current geographical location of the first station and the feature.

However, the preceding limitation is well known in the art of telecommunications.

Reudink et al. strongly suggests the use of road map that includes different signal attributes as related to the various environments encountered by the movement of the mobile device (col. 3, lines 25-50; col. 6, lines 52-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the system with conventional propagation prediction and determination tools because it would provide the system with full radio frequency modeling capabilities and terrain-based propagation model analysis so that integration of scanned topographic maps used as a base layer in the system can produce clear and easy to see RF coverage and analysis maps of the propagation environment under study. When using a conventional propagation model radio frequency planner, operators conventionally classify the different types of propagation environments into urban, suburban, and rural areas, in order to get a correction factor, which is conventionally an attribute applied to the type of terrain or environment encountered by the mobile unit movement, of the different conditions that surround the particular environments such as natural obstacles, for instance trees, and man-made structures such as buildings; so that an accurate prediction of the signal behavior could be acquired. The former may be performed with Hata-Okumura model based radio-planning software, such model is conventional, to simulate the signal propagation in

order to optimize the location of the different base stations. That together with a site survey is always needed to actually measure the noise of other radio sources.

Regarding claim 25, Reudink et al. disclose an arrangement; further comprising means for receiving signals from a satellite based positioning system (col. 6, lines 64-67; col. 7, lines 6-8, a satellite based positional system may be utilized).

Regarding claim 26, Reudink et al. disclose an arrangement, further comprising means for determining if an update of the data concerning the radio propagation environment is required (col. 11, lines 62-67; col. 12, lines 5-11, the system provides means to update data information when necessary).

Regarding claim 27, Reudink et al. disclose an arrangement, wherein the first station comprises a portable device comprising the determining means for determining the feature of the radio signal (col. 5, lines 58-67; col. 6, lines 1-2; Fig. 1, the present system is with respect to cellular telephony; that includes a portable unit that is able to receive signals strengths sent by a base station).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 15-18, 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Reudink et al. (6195556).

Regarding claim 15, Reudink et al. disclose an arrangement for determining a distance between a transmitting station and a receiving station, comprising: storage means for storing a characteristic parameter describing a characteristic of the radio propagation environment of the receiving station (col. 7, lines 22-27; col. 8, lines 43-61; col. 11, lines 51-61, the attributes collected may be transferred to a database controller within the system for further processing and further display on the map to dispose the different propagation signals related to the environment); measurement means for providing a measurement of a feature of a signal transmitted from the transmitting station to the receiving station (col. 7, lines 9-20, the system provides means to

determine signal strength information); and a controller for receiving said measurement and for defining the distance between the transmitting station and the receiving station according to said measurement and the characteristic parameter (col. 11, lines 51-61, the attributes collected may be transferred to a database controller within the system for further processing).

Regarding claim 16, Reudink et al. disclose an arrangement, wherein the controller comprises means for determining a current geographical location of one of the stations (col. 6, lines 59-67; col. 7, lines 1-8, the location position of the BTSs or mobile units may be provided by a Satellite location system).

Regarding claim 17, Reudink et al. disclose an arrangement, further comprising: at least one further receiving station having a substantially fixed location and provided with a characteristic parameter describing a radio propagation environment of said at least one further receiving station (col. 3, lines 25-50; col. 6, lines 52-67; col. 7, lines 1-2; col. 9, lines 47-67; col. 10, lines 1-9, several parameters are combined to acquire the exact position of the mobile unit or range between the mobile unit and base station; study of the signal propagation environment is accomplished by utilization of known prediction propagation tools and thorough system tests are operated to record attributes related to propagation environment around the mobile); and means for providing a measurement of a feature of a signal transmitted from the transmitting station to the at least one further receiving station (col. 3, lines 50-57; col. 6, lines 9-20; col. 7, lines 9-20, signal strength is provided at the mobile station, corresponding to one of the characteristics of a received signal at the receiver), said feature facilitating

determination of a distance between the transmitting station and the at least one further receiving station, wherein the arrangement is such that the measurement of the feature of the signal transmitted to the at least one further receiving station is also used when determining the location of the transmitting station (col. 7, lines 27-67, the system provides means for determining the extent of space between the transmitting BTS and the mobile unit with the signal strength information, which determines the position of the mobile; thus, providing means to calculate the range between the mobile and the BTS by the performance of the product of the speed of light and the travel time of the signal from the BTS to the mobile unit).

Regarding claim 18, Reudink et al. disclose an arrangement, further comprising: at least one further transmitting station having a substantially fixed location and provided with a characteristic parameter describing a radio propagation environment of said at least one further transmitting station (col. 3, lines 25-50; col. 6, lines 52-67; col. 7, lines 1-2; col. 9, lines 47-67; col. 10, lines 1-9, several parameters are combined to acquire the exact position of the mobile unit or range between the mobile unit and base station; study of the signal propagation environment is accomplished by utilization of known prediction propagation tools and thorough system tests are operated to record attributes related to propagation environment around the mobile); and means for providing a measurement of a feature of a signal transmitted from the at least one further transmitting station to the receiving station, said feature facilitating determination of a distance between the receiving station and the at least one further transmitting station (col. 3, lines 50-57; col. 6, lines 9-20; col. 7, lines 9-20, signal strength is

provided at the mobile station, corresponding to one of the characteristics of a received signal at the receiver); wherein the arrangement is such that the measurement of the feature of the signal transmitted from the at least one further transmitting station is also used when determining the location of the receiving station (col. 7, lines 27-67, the system provides means for determining the extent of space between the transmitting BTS and the mobile unit with the signal strength information, which determines the position of the mobile; thus, providing means to calculate the range between the mobile and the BTS by the performance of the product of the speed of light and the travel time of the signal from the BTS to the mobile unit).

Regarding claim 20, Reudink et al. disclose an arrangement, wherein the feature of the signal is based on one or several of the following: travel time of the signal between the transmitting and receiving stations, signal travel time difference between the transmitting and receiving stations, strength of the received signal, quality of the received signal (col. 7, lines 22-27; col. 8, lines 1-9; col. 7, lines 22-27; col. 8, lines 1-29; col. 7, lines 9-20 and 28-42; col. 7, lines 58-67, signal strength is provided as well as travel time of the signal).

Regarding claim 21, Reudink et al. disclose an arrangement, comprising a mobile telecommunications system, wherein the transmitting station is a mobile station and the receiving station is a base station of the mobile telecommunications system or vice versa (col. 5, lines 58-67; col. 6, lines 1-2; Fig. 1, the present system is with respect to cellular telephony).

Regarding claim 22, Reudink et al. disclose an arrangement, wherein the receiving station comprises a sector antenna (It is inherent as evidenced by the fact that one of ordinary skill in the art would have recognized that a base station would require a receiving antennas in order to receive the electromagnetic waves signals transmitted by the transmitter; further, it is conventional to use either omni or sectorized antennas depending on the configuration of the terrain as designed by the operator).

Regarding claim 23, a location server for use in a telecommunications system for provision of location data of a mobile station having a radio connection with at least one base station of the telecommunications system, comprising: means for receiving measurement data from the telecommunications system concerning a feature of the connection between the mobile station and the base station, said feature facilitating determination of the distance between the mobile station and the base station (col. 7, lines 9-20, the system provides means to determine signal strength information and providing means to determine the distance); storage means for storing a characteristic parameter describing a radio propagation environment of the base station (col. 7, lines 22-27; col. 8, lines 43-61; col. 11, lines 51-61, the attributes collected may be transferred to a database controller within the system for further processing and further display on the map to dispose the different propagation signals related to the environment and the positions of mobiles in relation to the base stations); control means for defining a distance between the mobile station and the base station according to the measurement data and the characteristic parameter (col. 11, lines 51-61, the attributes

collected may be transferred to a database controller within the system for further processing).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the art with respect to mobile location and the calculation of the distance between two stations.

US Pat. No. 5926133 to Green, Jr.	Differentially corrected position for mobile communications.
US Pat. No. 6438380 to Bi et al.	Robust location of a mobile.
US Pat. No. 5913170 to Wortham	Locating system using a mobile unit.
US Pat. No. 5299132 to Wortham	Vehicle locating
US Pat. No. 6236849 to Reudink et al.	Determining a mobile station position.
US Pat. No. 5781864 to Reudink	Mobiles with located pre-defined positions.
US Pat. No. 22030134648 to Reed et al.	Location for mobile devices

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio R Perez whose telephone number is (703) 305-8637. The examiner can normally be reached on Monday - Friday, 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Erika Gary can be reached on (703) 308-0123. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JP
7/6/04

ERIKA GARY
PATENT EXAMINER